UNDERSTANDING *PLATANTHERA CHAPMANII* (ORCHIDACEAE), ITS ORIGINS AND HYBRIDS

Paul Martin Brown

10896 SW 90th Terrace
Ocala, Florida 34481, U.S.A.

ABSTRACT

Platanthera chapmanii (Small) Luer emend. Folsom is a rare orchid endemic to the southern coastal plain of the southeastern United States. Since its original description by Small in 1902 as *Blephariglottis chapmanii*, *Platanthera chapmanii* has been recognized at various taxonomic levels. Folsom (1984) clarified this problem by once again recognizing it at the species level and also provided evidence for the hybrid origin of the species and a new contemporary hybrid, *P.* ×*channellii*. Because Folsom's work was not widely available, much misunderstanding still persists as to the correct identity and rank of *Platanthera chapmanii*. Several species and hybrids are involved in this complex and all have contributed to the confusion. Those misunderstandings and relationships are clarified here.

RESUMEN

Platanthera chapmanii (Small) Luer emend. Folsom es una orquídea rara endémica de la llanura costera del Sur de los Estados Unidos. Desde su descripción original por Small en 1902 como *Blephariglottis chapmanii*, *Platanthera chapmanii* ha sido reconocida en varios niveles taxonómicos Folsom (1984) clarificó este problema reconociéndola una vez más a nivel específico y también aportó pruebas del origen híbrido de la especie y un nuevo híbrido contemporáneo, *P.* _*channellii*. Debido a que el trabajo de Folsom no estuvo ampliamente disponible, todavía persiste mucho malentendido para la correcta identidad y rango de *Platanthera chapmanii*. Varias especies e híbridos están implicados en este complejo y todos han contribuido a la confusión. Se clarifican estos errores y relaciones.

Although geographically restricted to the southern portion of the southeastern United States, Chapman's fringed orchis, *Platanthera chapmanii* (Small) Luer emend. Folsom, is an important component of the summer-flowering orchid flora of this area. No other complex within the Orchidaceae in the southeastern United States has the unique position of having a species with an ancestral hybrid origin: *P. chapmanii*, and also having a current, or contemporary, occurring hybrid: *P.* ×*channellii*, with the same parentage. Historically known from East Texas, much of northern Florida, and southern Georgia, today it can be best found in the Apalachicola and Osceola National Forests of Florida. A few other small sites in northern Florida persist. The species is absent from the eastern half of the Panhandle. The Marion and Polk County, Florida records appear to be Channell's hybrid fringed orchis, *P.* ×*channellii* Folsom. Few sites remain in East Texas (Liggio & Liggio 1999) and the Georgia locales are based upon historic collections. No collections have ever been made from the area between the Apalachicola National Forest and East Texas.

SIDA 21(2): 853–859. 2004

Although Correll cites the range for *Platanthera chapmanii* (as *Habenaria ×chapmanii*) from New Jersey to Georgia and Florida and west to Texas, he was basing his knowledge on plants of both *P. chapmanii* and *P. ×channellii*. True *Platanthera chapmanii* has always been, and continues to be, one of the rarest orchids found in North America and is endemic to this lower portion of the southeastern Coastal Plain (Fig. 1) (Brown & Folsom 2002).

Chapman's fringed orchis originally was described by Small (1903) as *Blephariglottis chapmanii*. Ames (1910), noting its intermediacy between *Habenaria ciliaris* and *H. cristata*, made a new combination as *Habenaria × chapmanii*. This hybrid status remained for many years, including the new combination of *Platanthera ×chapmanii* (Small) Luer made by Luer (1972). It was not until Jim Folsom's work in 1984 that the taxon was restored to its rightful status of full species and a new, contemporary, hybrid, *P. ×channellii*, was described (Folsom 1984).

Understanding *Platanthera chapmanii* and its relationships to the closely related orange fringed orchis, *P. ciliaris*, and orange crested orchis, *P. cristata*, is greatly simplified if the observer can see all three taxa in one field session. This can only be accomplished in the Osceola National Forest, because *P. ciliaris* is historically and apparently currently absent from any of the other known localities. Liggio and Liggio (1999) clearly state that *P. ciliaris* has never been found within any of the Texas locales for *P. chapmanii*. Although vouchered from the panhandle counties encompassing the Apalachicola National Forest, no records exist for *P. ciliaris* within the Apalachicola National Forest (Anglin, pers. comm.; Brown & Folsom 2002; Folsom 1984, 1985). Conversely, *P. cristata* is often found growing within or nearby many of the *P. chapmanii* sites, especially in eastern Florida.

Folsom (1984) clearly demonstrated that the origins of *Platanthera chapmanii* were most likely an ancient hybridization of *P. ciliaris* and *P. cristata*. Therefore *P. chapmanii* is intermediate in size and characters between the two ancestors. Over the years it has evolved into a stable, reproducing species with a very distinctive bent column. This evolution of the column shape is critical in the pollination of the species. At the same time the contemporary hybrid of *P. ciliaris* and *P. cristata*, Channell's hybrid fringed orchis, *P. ×channellii*, occurs in rare situations when both parents are present. It, too, is intermediate between the parents, but the column is unlike that of *P. chapmanii*. Folsom (1984) illustrates all of these characters in great detail. Because Folsom's original publication in *Orquidea* (Mex.) was not readily available to many interested orchidists, the article, with minor revisions, was reprinted in the *North American Native Orchid Journal* in 1995, and included all of Folsom's graphics (Folsom 1995).

One of the best aids in the initial determination of plants in the field is observing what predominates in the area. If both *Platanthera ciliaris* and *P. cristata* are present and only a few intermediates are to be found, then they in

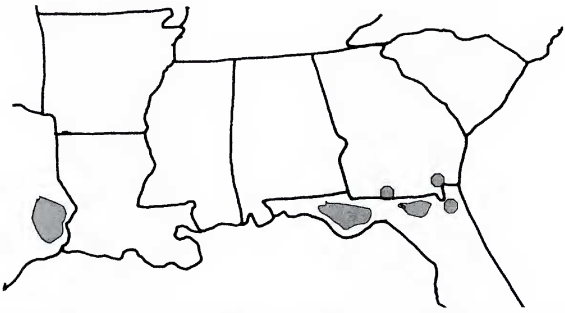

FIG. 1. Distribution of Chapman's fringed orchid (*Platanthera chapmanii*) in the southeastern United States.

all probability would be the hybrid *P.* ×*channellii*. If the majority of plants appear intermediate between *P. ciliaris* and *P. cristata* and only a few of either of the latter species are present then the observer needs to look carefully at the shape of the column, and most likely the majority of plants will be *P. chapmanii*. The rostellum lobes of the column in *P. chapmanii* have a prominent, distinctive, and characteristic hook that is clearly visible while the rostellum lobes of the columns of *P. ciliaris* are triangular and the tips pointing straight forward and those of *P. cristata*, are much shorter, nearly truncated, and with a very slight hook.

In addition, characters that help in determining which species are present may also include geographic location, diameter of raceme, size of flower, length and position of spur, and shape of orifice (Folsom 1984, 1995). To simply state that *Platanthera ciliaris* is larger, *P. chapmanii* intermediate in size, and *P. cristata* smaller has led to much confusion. For many orchid enthusiasts this, although not explicitly stated, implied overall size, especially height. That is not accurate and height should never be taken into account. All three species can grow from 10 or 15 cm to, in the case of *P. chapmanii* and *P. ciliaris*, over a meter in height! When size comparisons are made they refer to the diameter of the raceme and the measurements of the individual flowers. Even the overall height of the flowering raceme is not a good criterion for identification. Because of the ancestral parentage of *P. chapmanii* plants can easily favor the overall raceme shape of either parent, but the raceme diameter appears to remain constant. Spur length in the three species is helpful as well. Typically, in *P. ciliaris* the spur is 20–25 mm long, in *P. chapmanii* 10–14 mm long, and in *P. cristata* 5–

8 mm long. Figures 2 and 3 show the relationships of *P. cristata*, *P. chapmanii*, and *P. ciliaris* and will assist in understanding this comparison.

In addition to understanding the species orchid observers need to be aware of the hybrids that are involved in this complex include:

Platanthera ×apalachicola P.M. Brown & S. Stewart—(*P. chapmanii* × *P. cristata*)

Platanthera ×channellii Folsom—(*P. ciliaris* × *P. cristata*)

Platanthera ×osceola P.M. Brown & S. Stewart—(*P. chapmanii* × *P. ciliaris*)

Relationships among this group are best summed up in Figure 4. *Platanthera blephariglottis*, *P. conspicua*, and *P. integrilabia* are included in this diagram for completeness in the group (Brown 2003; Brown & Folsom 2004). These relationships and putative parentages are based upon morphological criteria. Artificially created hybrids, cytological, and molecular work has yet to be done on this entire complex.

Because hybrid swarms of some or all three species occur it may be difficult to determine individual plants. *Platanthera ×apalachicola* is locally common in northern Florida where both parents frequently grow together. They usually occur as individuals and may appear within stands of *P. chapmanii* as smaller flowered, more slender plants or within stands of *P. cristata* as larger flowered more robust individuals. The hooked column of *P. chapmanii* is usually dominant, but the spur length and position is intermediate (Brown & Stewart 2003).

Platanthera ×channellii and *P. chapmanii* can be difficult to tell apart. In the field one of the best ways is to look about and see which other species are growing nearby. If all the plants observed are the same, and within the range of *P. chapmanii*, it is most likely *P. chapmanii*, whereas if it is a colony of mixed species and only a few intermediate plants are present it is more likely to be *P. ×channellii*.

Platanthera ×osceola is known only from Osceola National Forest where it is the only place documented that both parents are found growing together. Plants of the hybrid usually occur as individuals and may appear within stands of *P. chapmanii* as larger flowered, more robust plants with decidedly longer spurs or within stands of *P. ciliaris* as smaller more compactly flowered individuals. The hooked column of *P. chapmanii* is not as dominant as in *P. ×apalachicola* (Brown & Stewart 2003).

Understanding both the history of *Platanthera chapmanii* and the hybrid swarms that may accompany plants in the wild hopefully will help in clarifying some of the mystery around this rare and spectacular orchid. Photographs and details of all of the taxa mentioned above are found in Brown and Folsom (2002, 2003, and/or 2004). All orange-flowered plants throughout the over-

FIG. 2. Ancestral parentage of *Platanthera chapmanii*. From left to right in all photos: *Platanthera cristata*, *chapmanii*, and *ciliaris*.

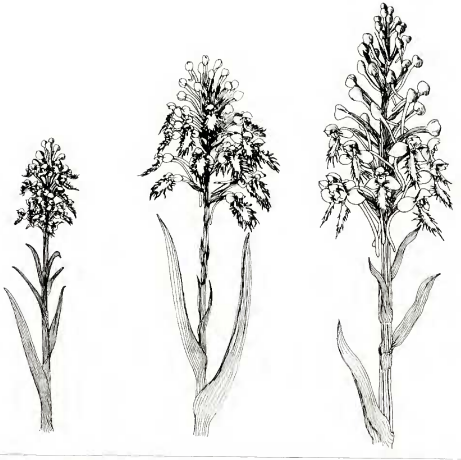

FIG. 3. *Platanthera* cristata (left), *Platanthera chapmanii* (center), *Platanthera ciliaris* (right).

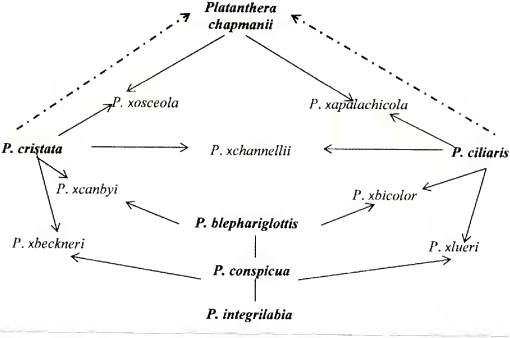

FIG. 4. Relationships among related species in the orange and white fringed orchid complex. *Platanthera blephariglottis*, *P. conspicua*, and *P. integrilabia* are included for completeness in the group.

lapping ranges of *P. ciliaris*, *P. cristata*, and *P. chapmanii* should be carefully examined for the possibility of additional sites for Chapman's fringed orchis.

ACKNOWLEDGMENTS

The author thanks Scott Stewart, Bill and Pamela Anderson, Gustavo Romero (AMES), and Guy Anglin for assistance in locating populations in the field. Scott Stewart, Joe Liggio, and Larry Magrath made several helpful suggestions. Jim Folsom provided initial information some years ago and Stan Folsom executed the line art.

REFERENCES

Ames, O. 1910. Orchidaceae: illustrations and studies of the family Orchidaceae issued from the Ames Botanical Laboratory, North Easton, Massachusetts. The genus *Habenaria* in North America. The Merrymount Press, Boston, MA. 4:155.

Brown, P.M. 2002. Revalidation of *Platanthera conspicua*, the southern white fringed orchis. North Amer. Native Orchid J. 8:3–9.

Brown, P.M. and S.N. Folsom. 2002. Wild orchids of Florida. University Press of Florida, Gainesville.

Brown, P.M. and S.N. Folsom. 2003. The wild orchids of North America, North of Mexico. University Press of Florida, Gainesville.

Brown, P.M. and S.N. Folsom. 2004. Wild orchids of the southeastern United States, north of peninsular Florida. University Press of Florida, Gainesville.

Brown, P.M. and S. Stewart. 2003. Two new hybrids in the genus *Platanthera*. North Amer. Native Orchid J. 9:35.

Folsom, J.P. 1984. Relationships in the yellow fringed orchid complex. Orquidea (Mex.) 9:321–45.

Folsom, J.P. 1995. The real identity of *Platanthera chapmanii*. North Amer. Native Orchid J. 1(3):211–238. (reprinted with minor changes from Folsom, 1984)

Liggio, J. and A.O. Liggio. 1999. Wild orchids of Texas. University of Texas Press, Austin.

Luer, C.A. 1972. The native orchids of Florida. New York Botanical Garden, Bronx.

Small, J.K. 1903. Flora of the southeastern United States. Published by the author, New York. P. 314.